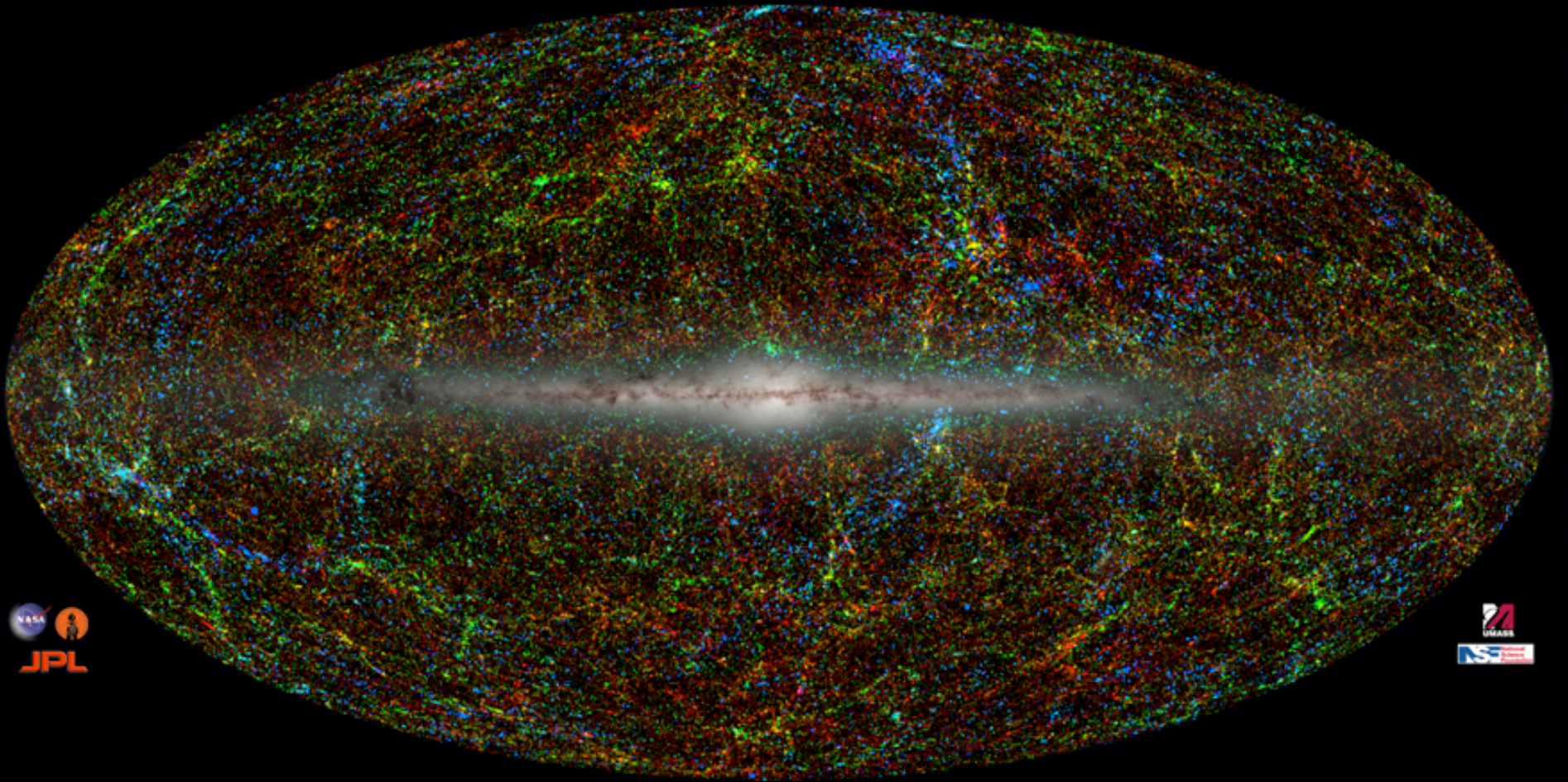


THE 2MASS REDSHIFT SURVEY



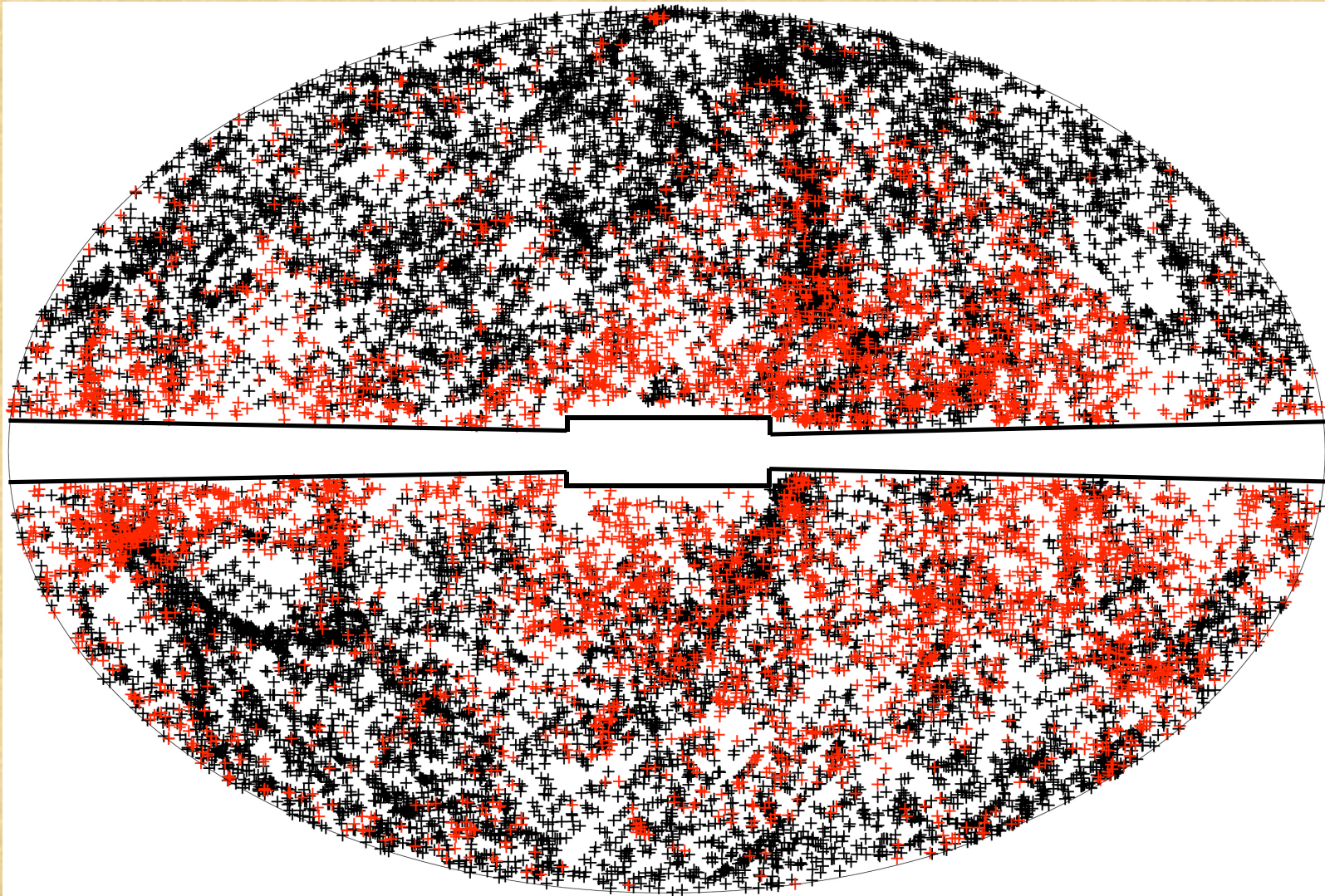
L. MACRI (NOAO) & J. HUCHRA (CFA)

T. JARRETT (IPAC); N. MARTIMBEAU, J. MADER,
P. BERLIND, M. CALKINS, S. TOKARZ (CFA/FLWO)

MOTIVATION

- **CARRY OUT AN ALL-SKY, FLUX-LIMITED REDSHIFT SURVEY BASED ON THE 2MASS XSC**
 - $K_{20FE} < 11.25$ MAG
 - $|B| > 5^\circ$
 - **STARTING POINT: ZCAT**
 - **A VERY INHOMOGENEOUS REDSHIFT DATABASE!**

STARTING POINT



24% INCOMPLETENESS, PRESENT AT ALL $|B|$

THE TELESCOPES

- **FRED L. WHIPPLE OBSERVATORY 1.5-M**
 - HOME OF THE ORIGINAL "Z-MACHINE"
 - FAST SPECTROGRAPH (REFURBISHED MID-2002)
 - QUEUE OPERATIONS, DEDICATED OBSERVERS, AUTOMATED PIPELINE
 - STARTED OBSERVATIONS IN 2000

THE TELESCOPES

- **CERRO TOLOLO OBSERVATORY 1.5-M**
 - **R-C SPECTROGRAPH (VINTAGE, BUT PRETTY GOOD)**
 - **NOAO LONG-TERM PROGRAM STATUS**
 - **1 WEEK PER SEMESTER FOR 9 SEMESTERS**
 - **NO QUEUE, NO DEDICATED OBSERVERS**
 - **DATA REDUCTION BY HAND, FOLLOWING FLWO PIPELINE PRESCRIPTIONS**

THE TELESCOPES

- **MCDONALD OBSERVATORY 2.1-M**
 - A COUPLE OF RUNS, ~100 REDSHIFTS

- **CTIO 4-M**
 - FOR $5^\circ < |B| < 10^\circ$ SOUTHERN OBJECTS
 - PRETTY ANCIENT SPECTROGRAPH, NOT VERY GOOD

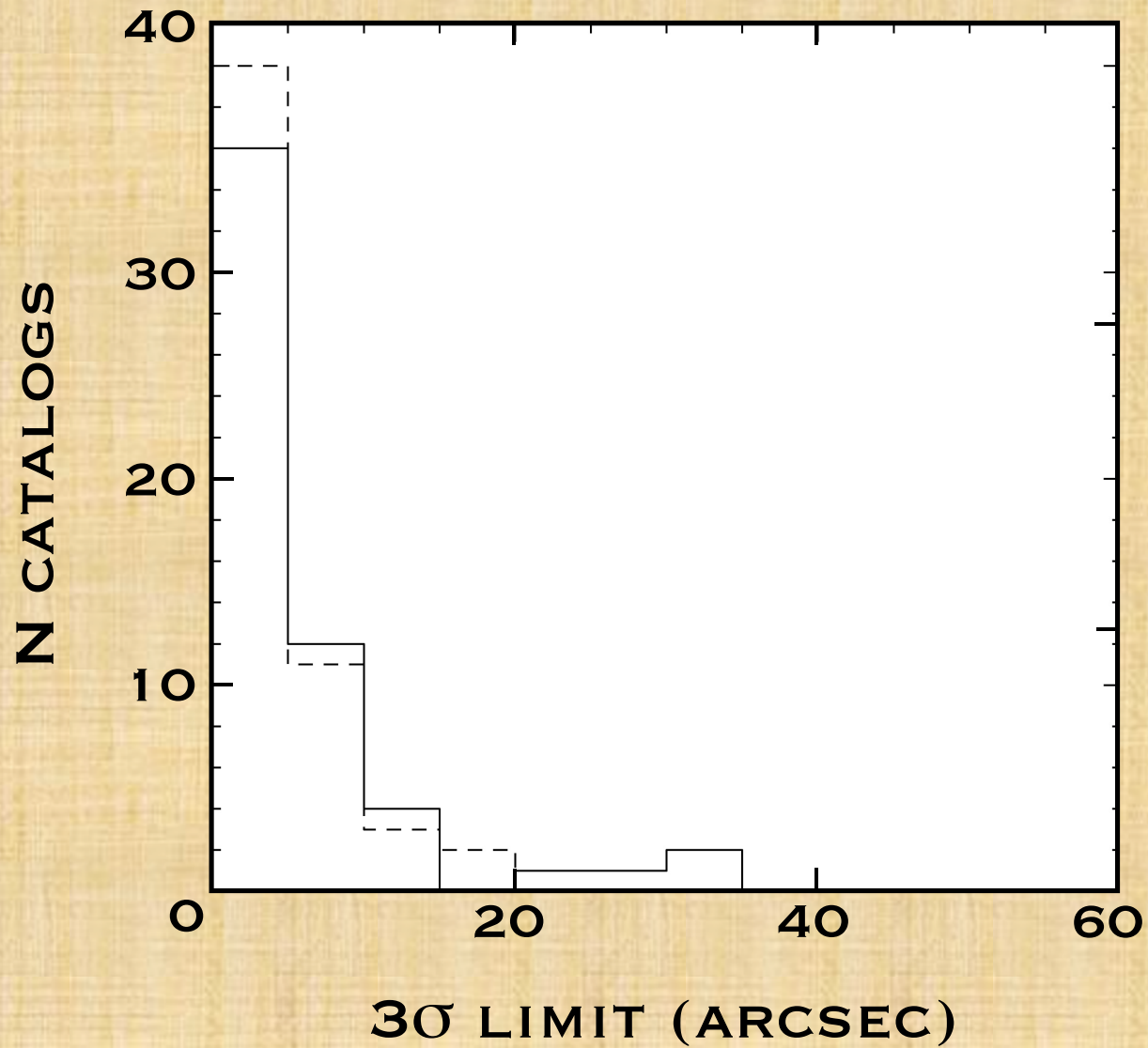
THE MATCHING

- **DEVELOPED IDL MATCHING PROGRAM**
 - **2MASS XSC AGAINST ZCAT**
 - **2MASS XSC AGAINST NEW CATALOGS**
 - **FLWO/CTIO OBSERVATIONS, 2DF, SDSS, 6DF**
 - **IDENTIFY GALAXIES WITHOUT Z, GENERATE OBSERVING LISTS, FINDING CHARTS, ETC.**

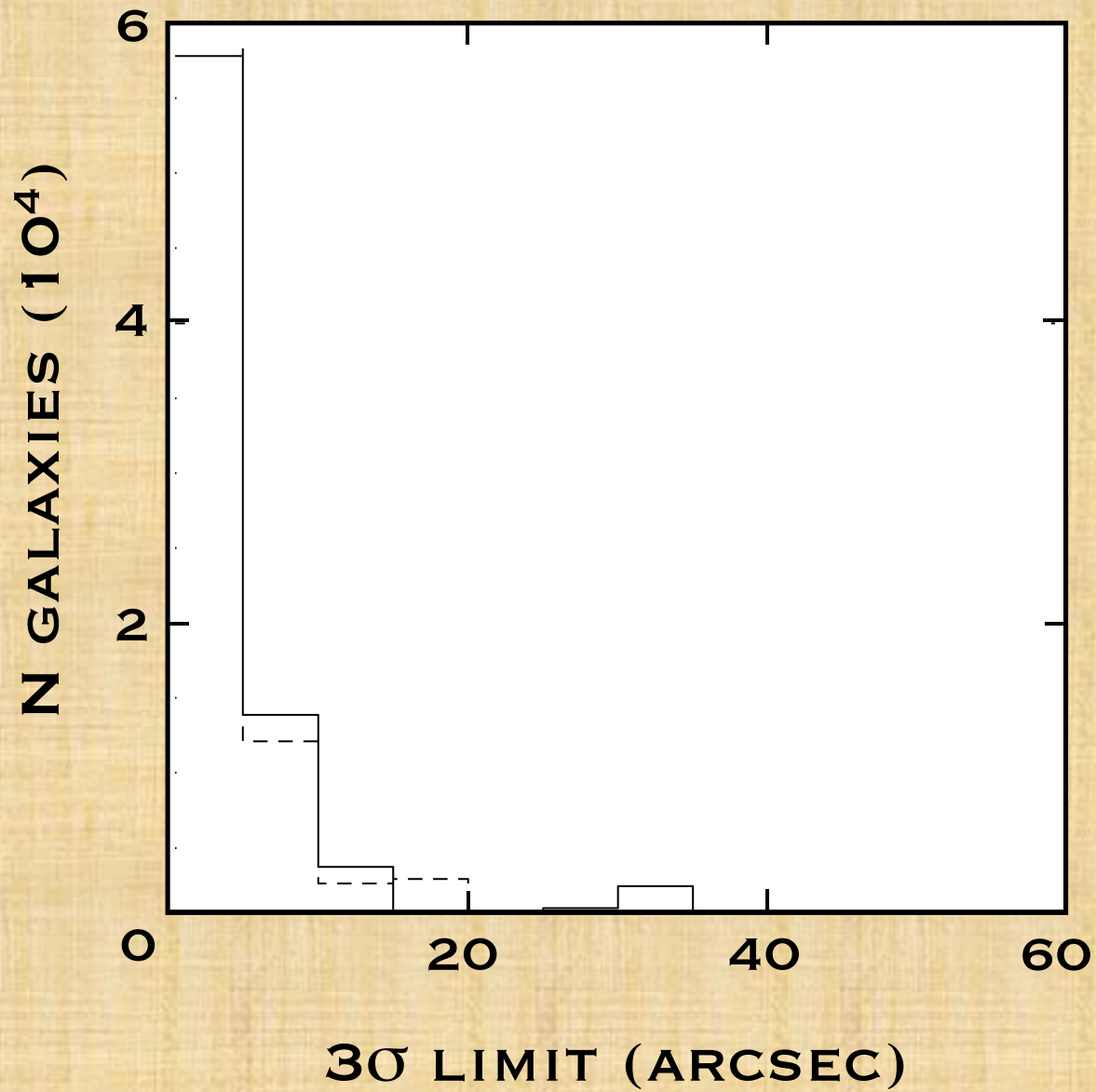
THE MATCHING

- ZCAT VERY INHOMOGENEOUS
 - EXAMINE CONTENTS ON A SOURCE-BY-SOURCE BASIS
 - DETERMINE Δ_{POS} , 3σ ERROR ELLIPSE (SOURCE-2MASS), REJECT OUTLIERS
 - REJECT SOURCES WITH VERY BROAD ERROR DISTRIBUTIONS
 - IDENTIFY DATA INGESTION ERRORS

THE MATCHING



THE MATCHING



THE NUMBERS ($|B| > 5^\circ$)

SOURCE	N (K<11.25)
ZCAT	17144
FLWO	2477
CTIO	2446
6DFGS DR1*	359
SDSS DR3*	157
TOTAL	22583
NO Z	303

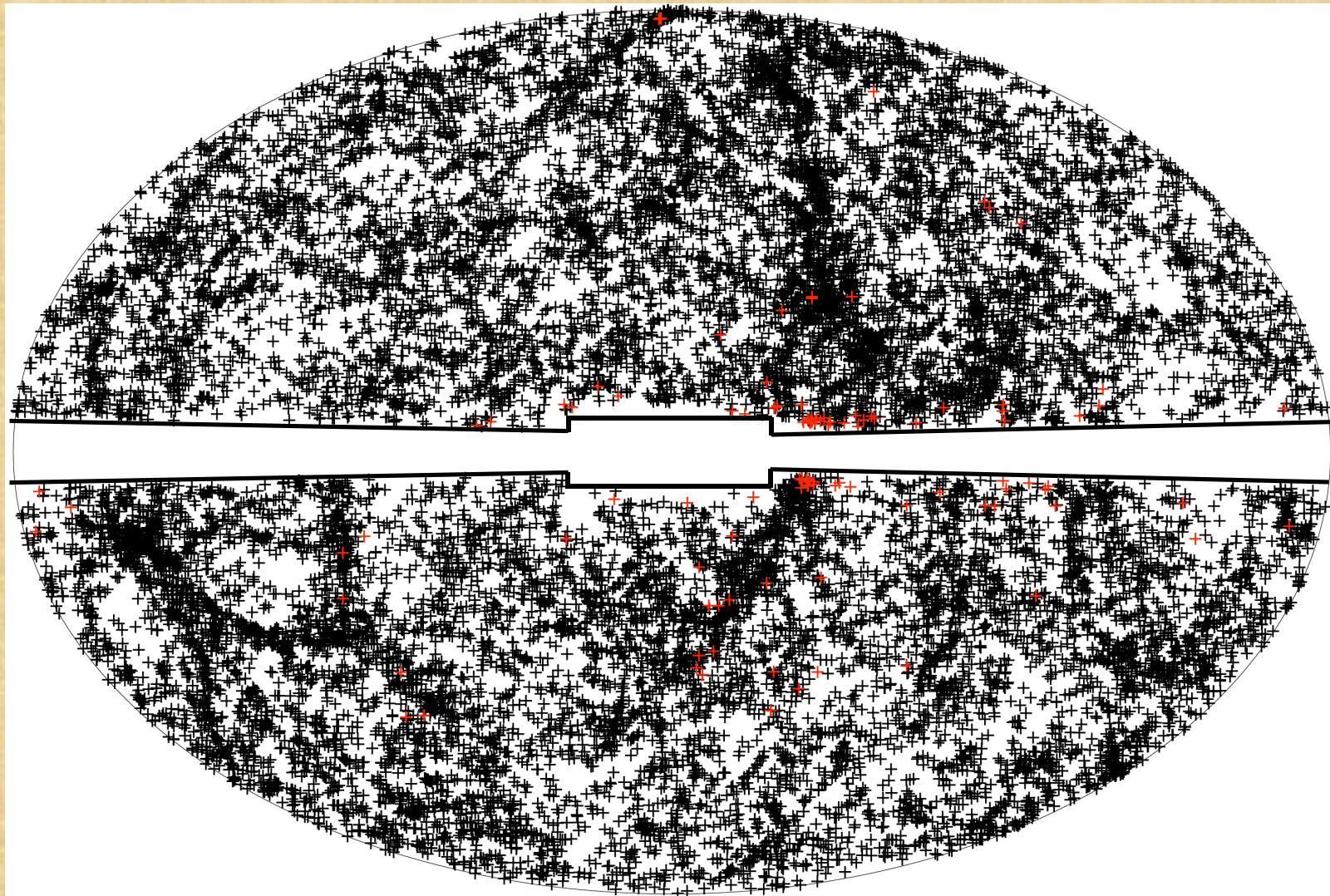
*: UNIQUE TO CATALOG

THE NUMBERS ($|B| > 5^\circ$)

SOURCE	N (K<11.25)	N (K<12.25)
ZCAT	17144	35713
FLWO	2477	5675
CTIO	2446	2663
6DFGS DR1*	359	7541
SDSS DR3*	157	3345
TOTAL	22583	54937
NO Z	303	36141

*: UNIQUE TO CATALOG

FINAL 2MRS CATALOG



MACRI ET AL. (2005)

THE SCIENCE

- **LUMINOSITY FUNCTIONS**

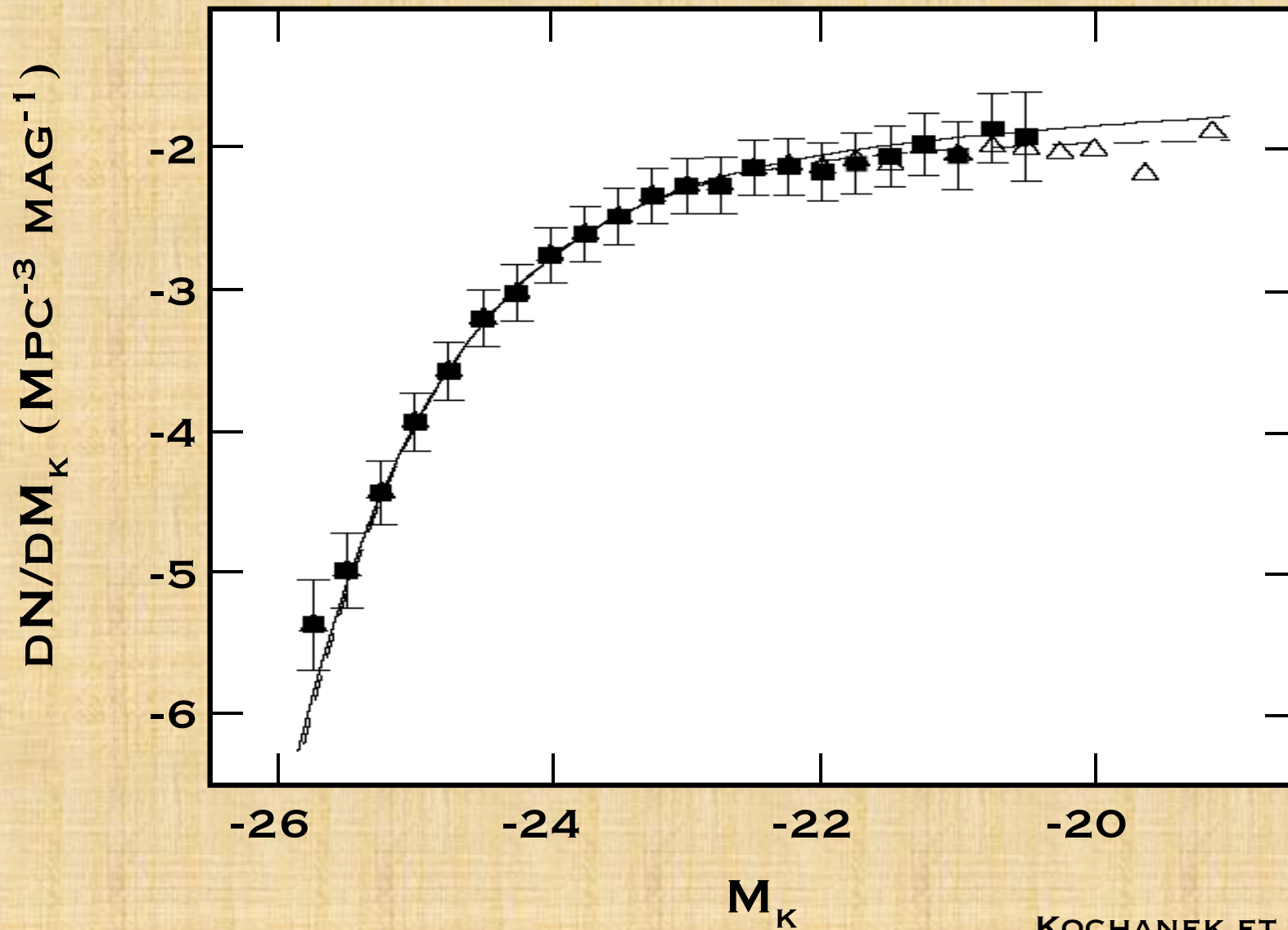
- **KOCHANEK ET AL. (2001)**

- K_s (ISO CIRC), 4×10^3 GALs, 2MASS DR2, 2 STER.

- **HARTMANN ET AL. (2005)**

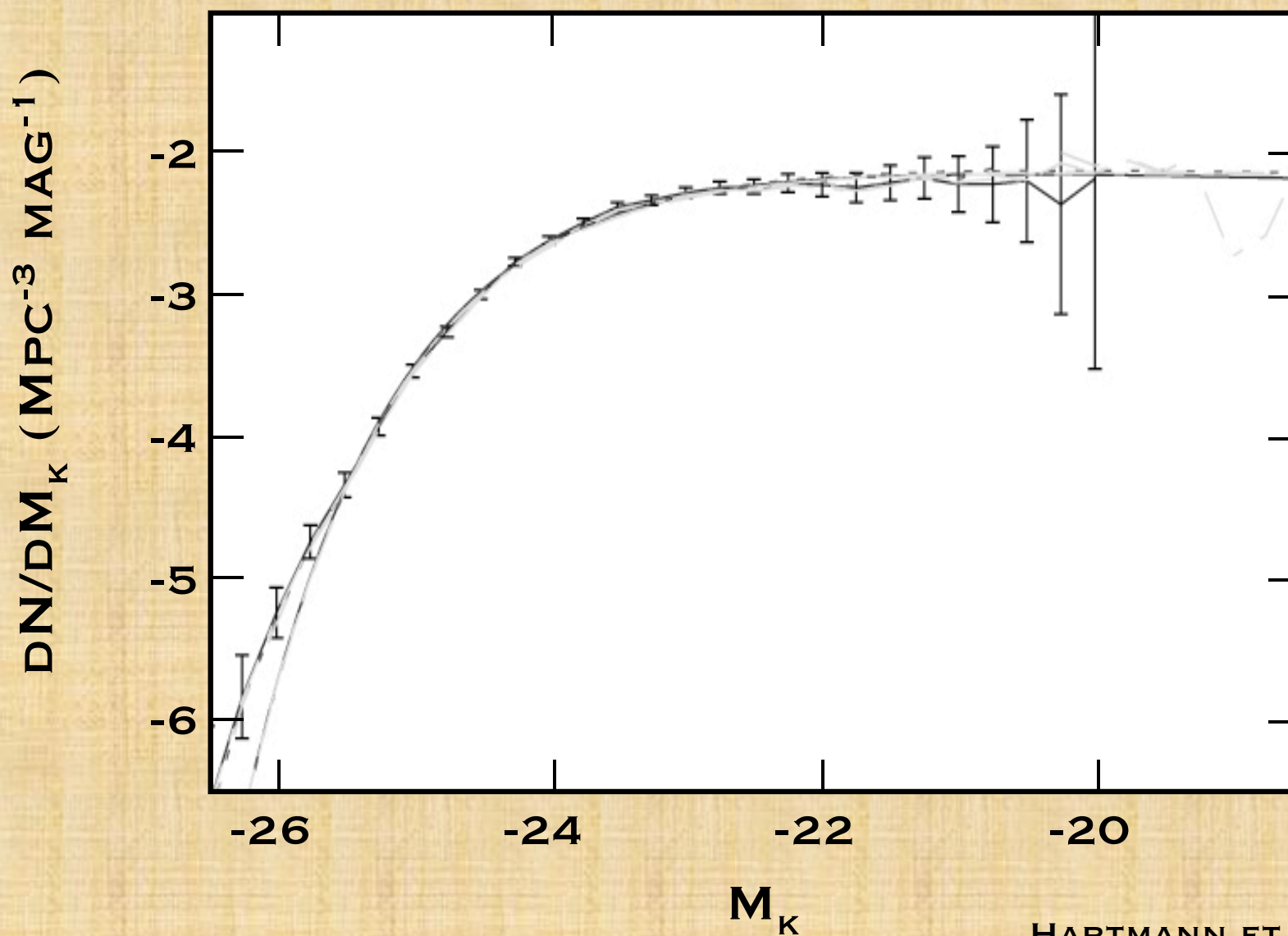
- JHK_s (ISO ELL, KRON), 2×10^4 GALs, XSC, ($|B| > 10^\circ$)

LUMINOSITY FUNCTIONS



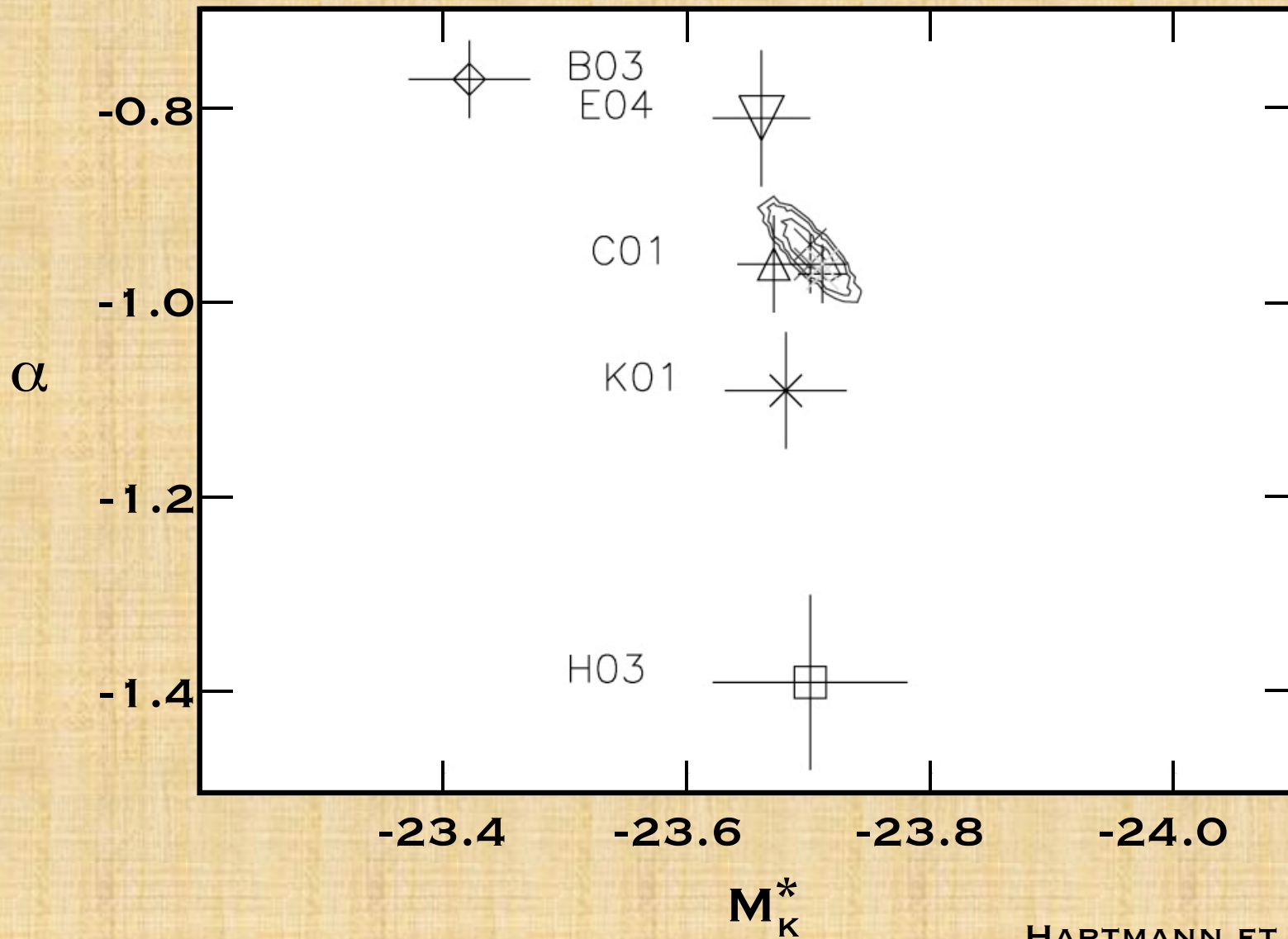
KOCHANEK ET AL. (2001)

LUMINOSITY FUNCTIONS

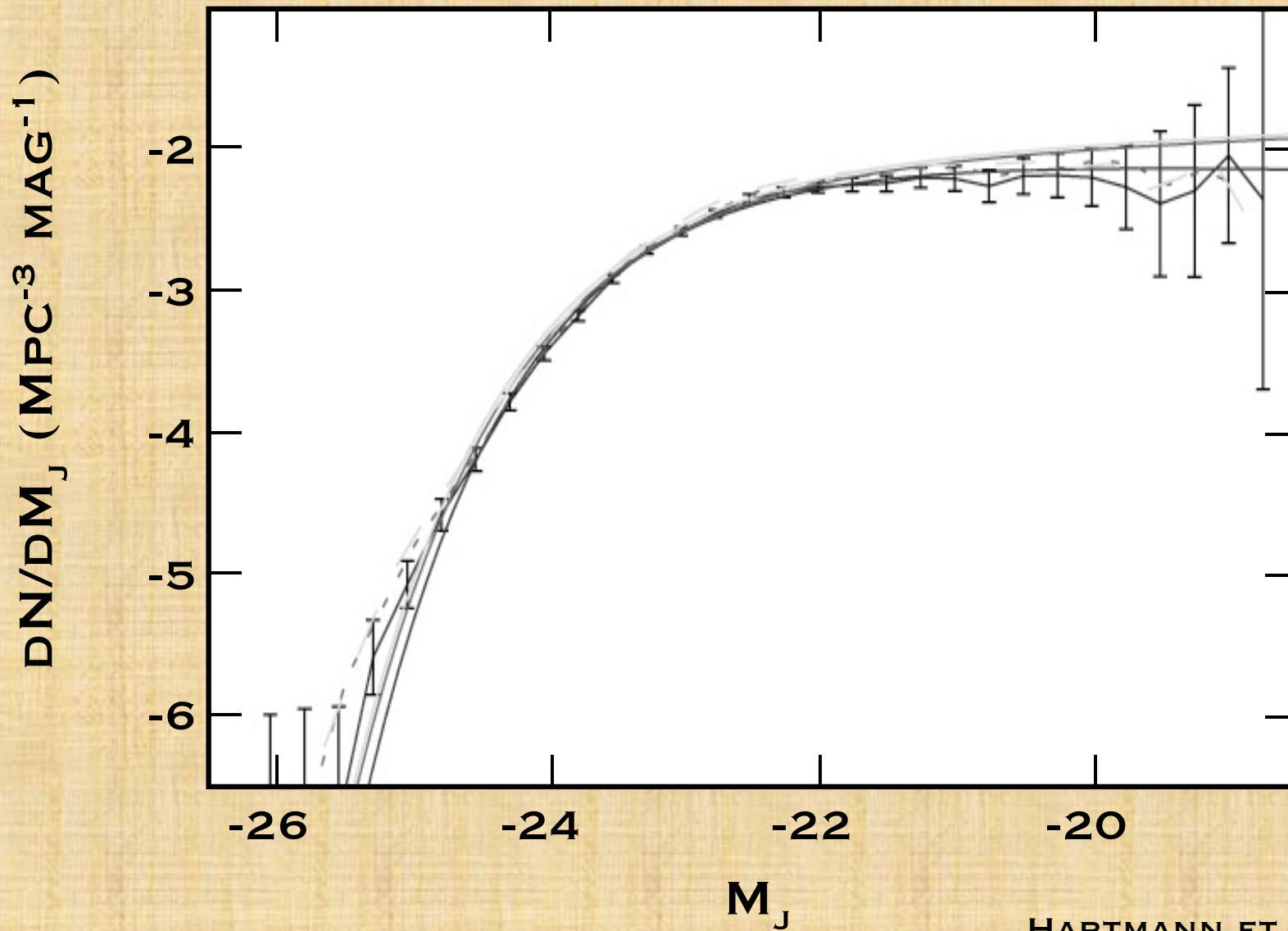


HARTMANN ET AL. (2005)

COMPARISON WITH PREVIOUS WORK

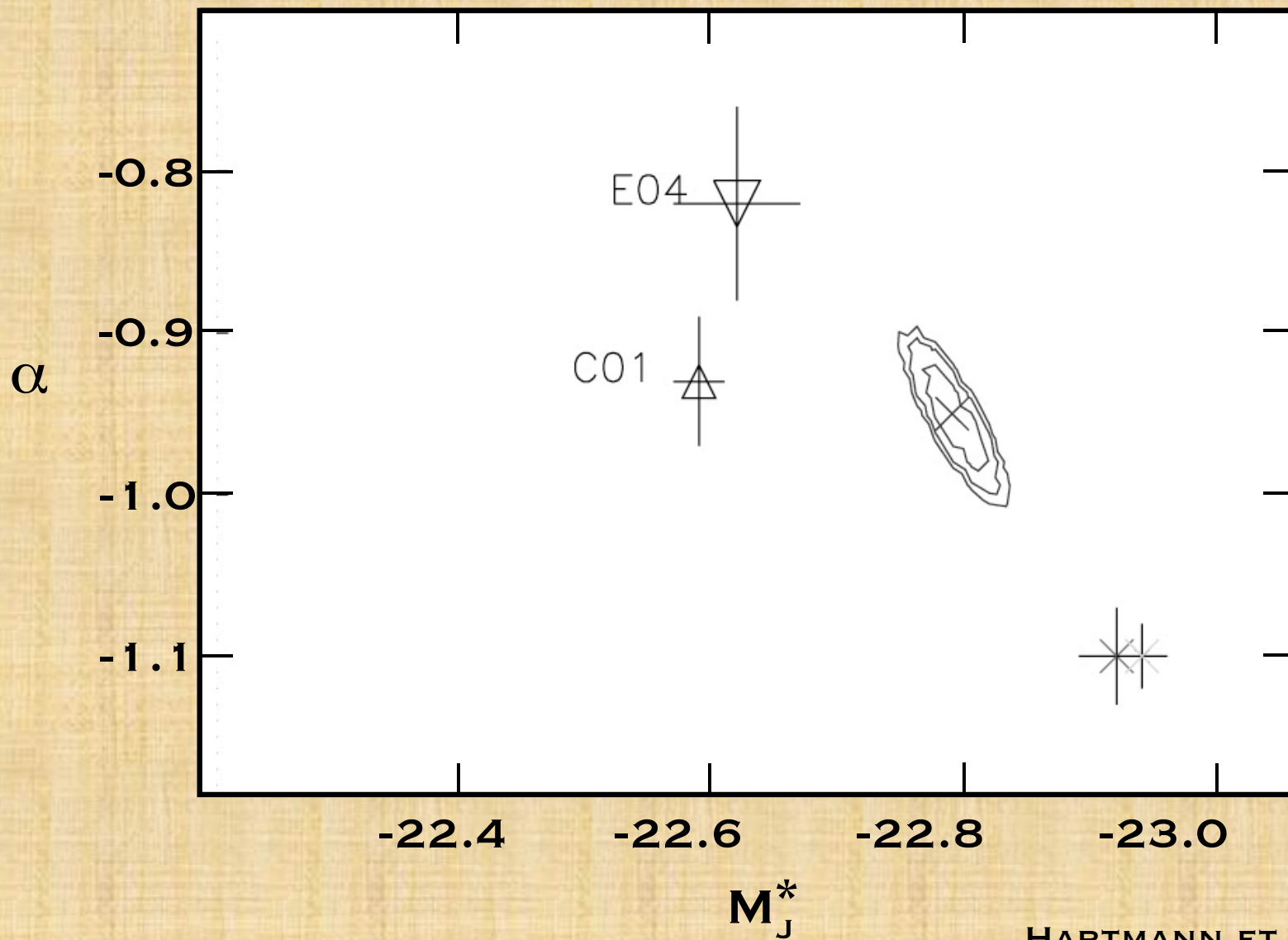


LUMINOSITY FUNCTIONS

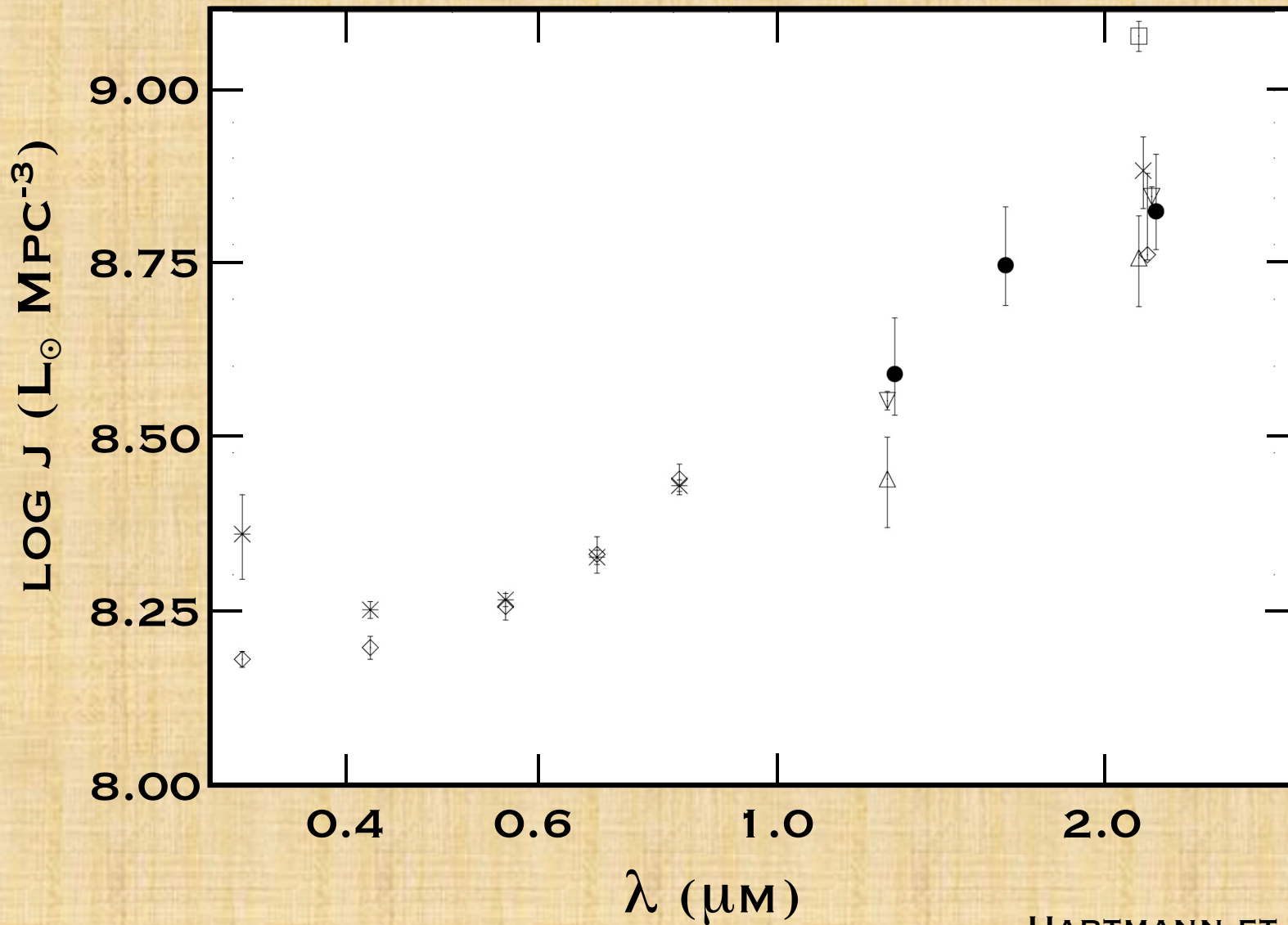


HARTMANN ET AL. (2005)

COMPARISON WITH PREVIOUS WORK

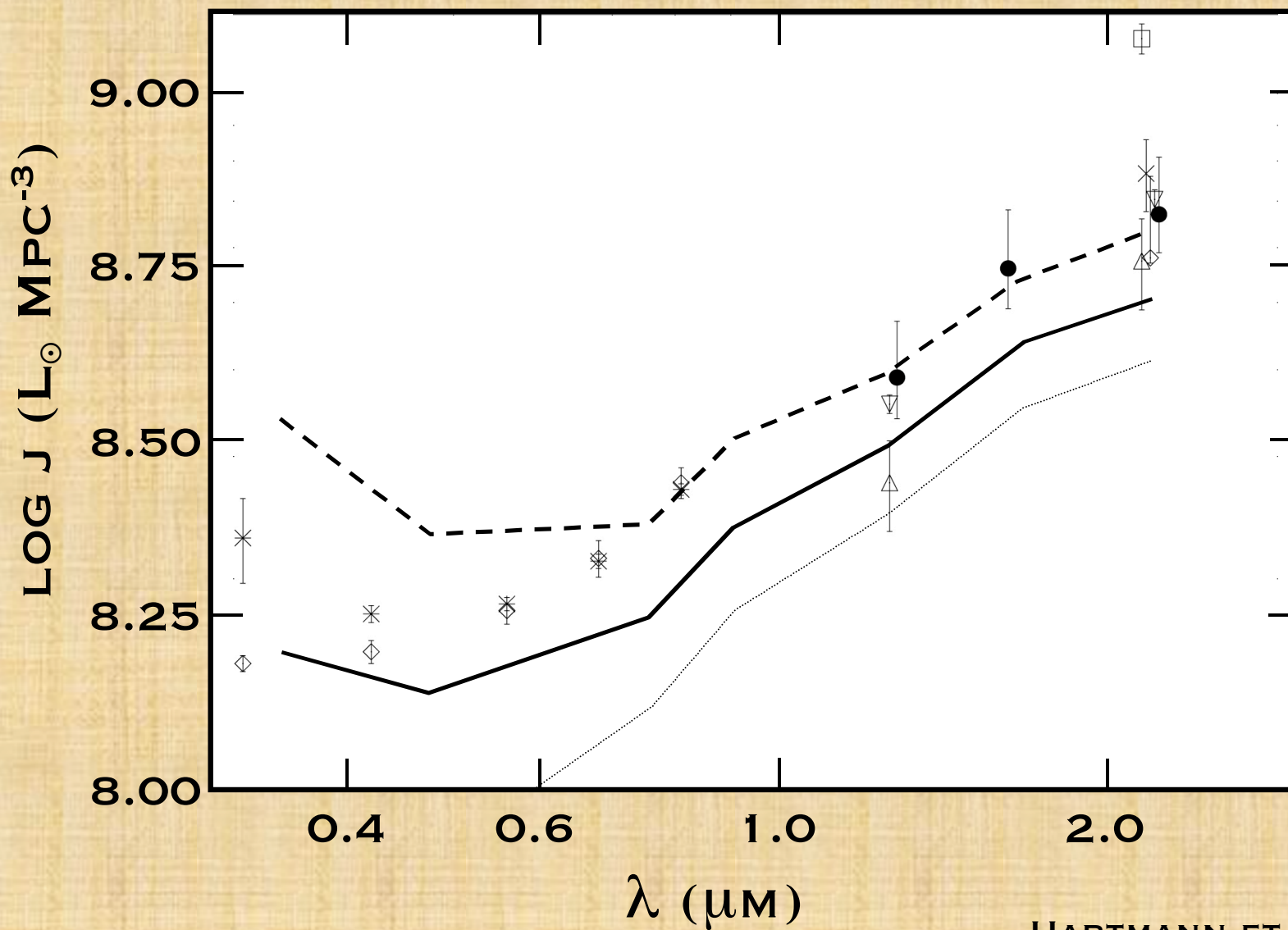


LUMINOSITY DENSITY



HARTMANN ET AL. (2005)

LUMINOSITY DENSITY

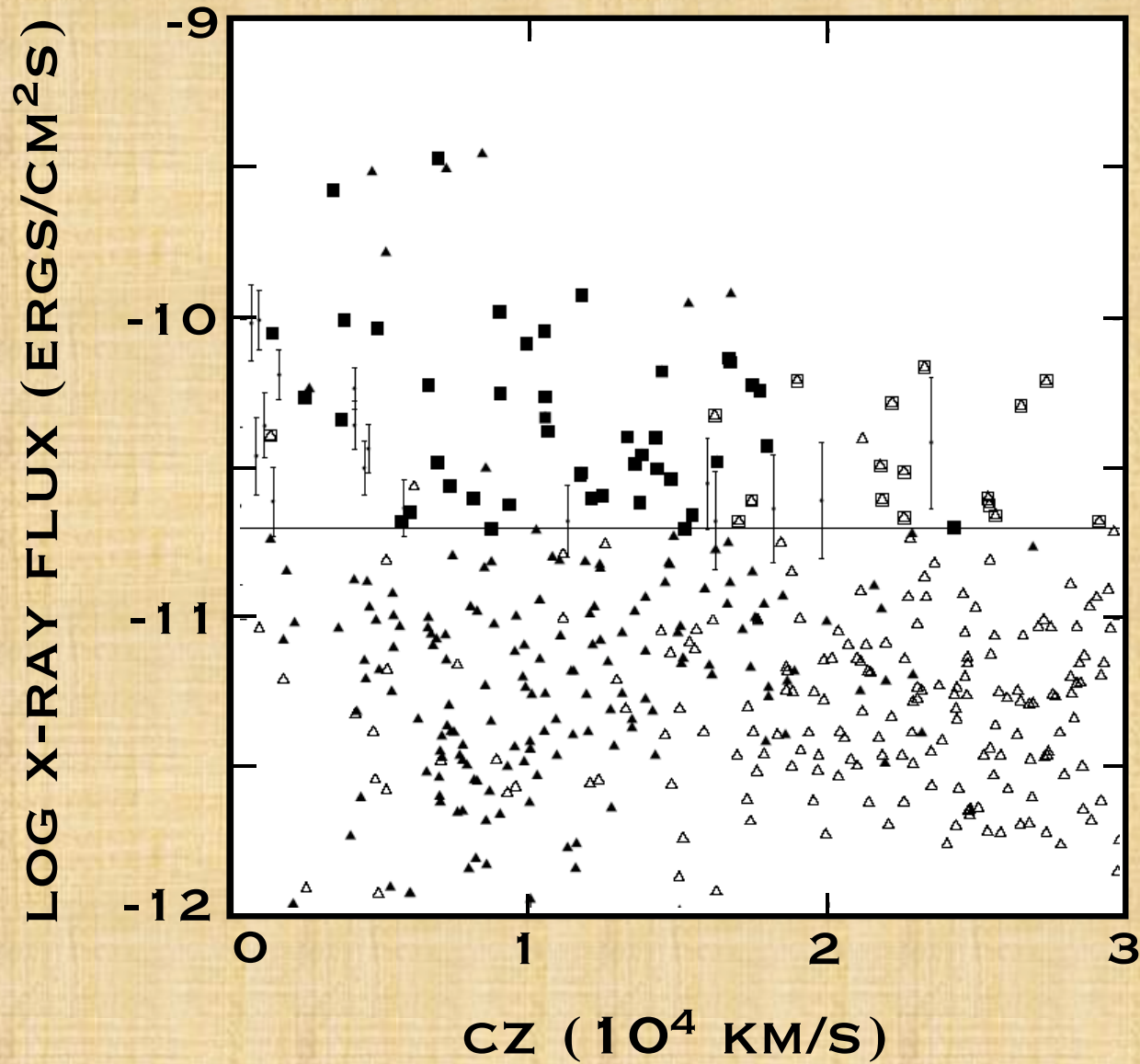


HARTMANN ET AL. (2005)

THE SCIENCE

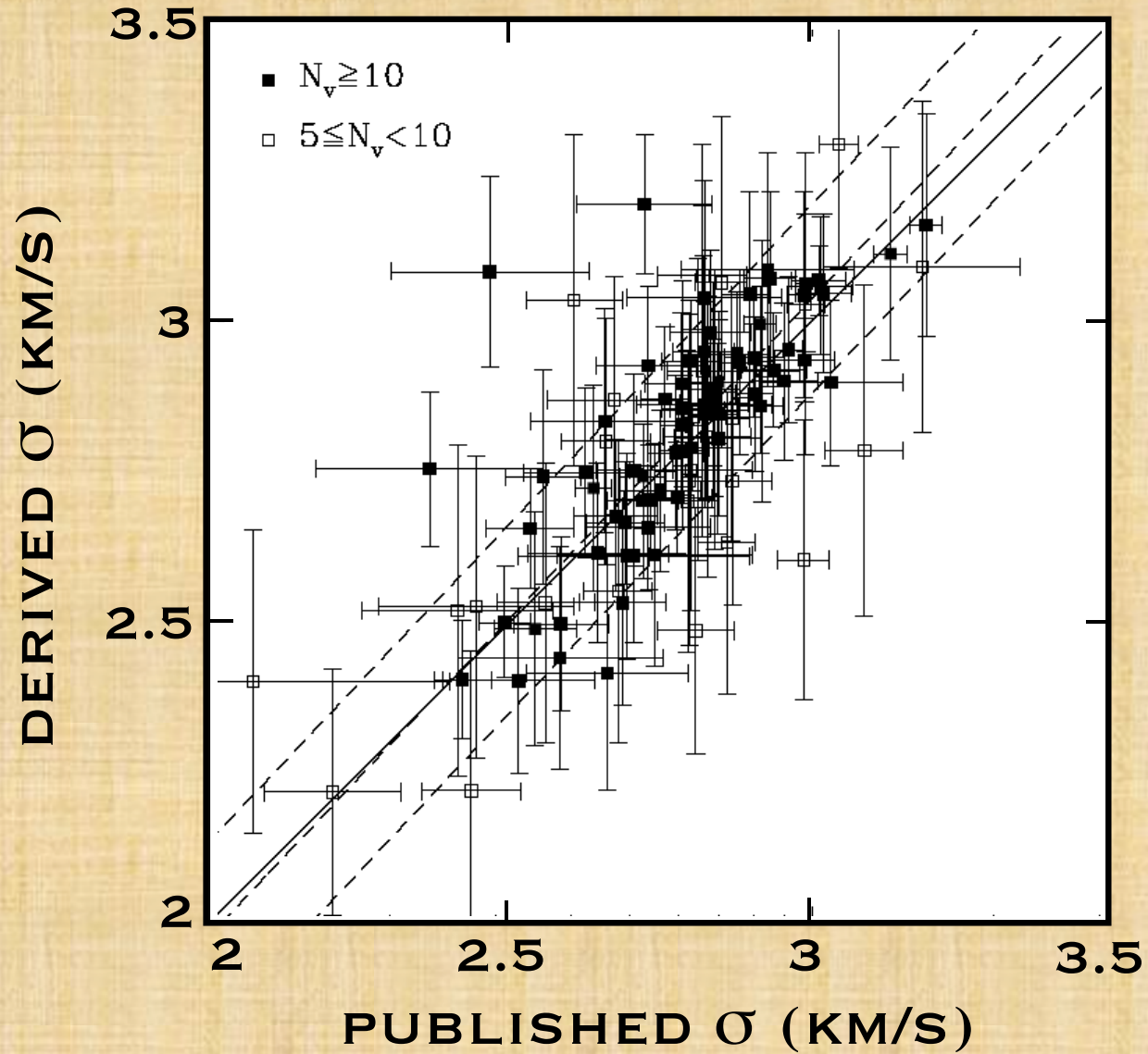
- **GALAXY CLUSTERS (KOCHANЕК ET AL. 2003)**
 - K_s (ISO CIRC) < 12.25, 9×10^4 GALS, XSC, $|B| > 5^\circ$
 - MATCHED FILTER ALGORITHM (USE Z WHEN AVAILABLE)
 - FOUND 363 CLUSTERS
 - STUDY HALO MULTIPLICITY FUNCTION, CLUSTER NUMBER FUNCTION

GALAXY CLUSTERS

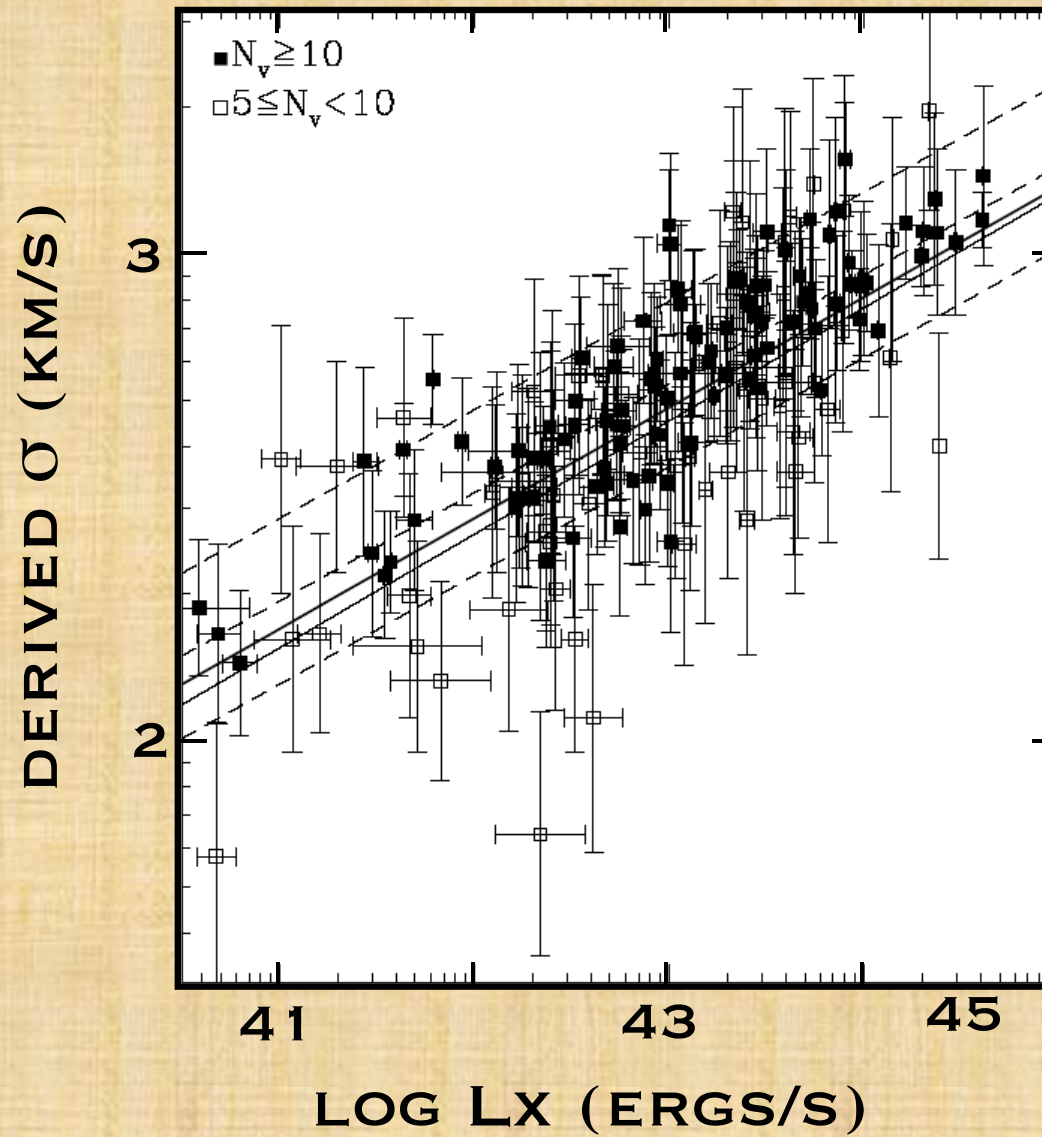


KOCHANEK ET AL. (2003)

GALAXY CLUSTERS

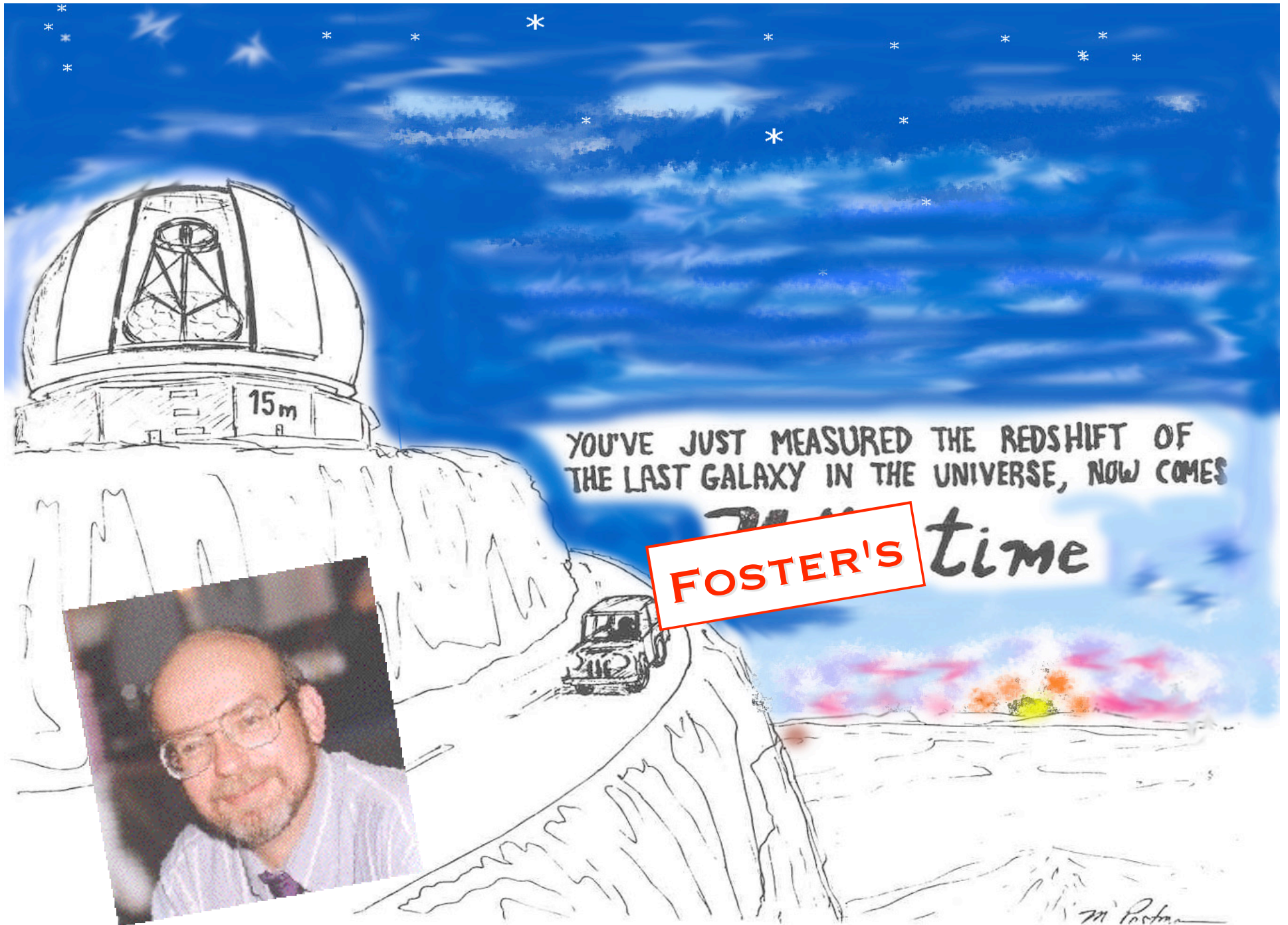


GALAXY CLUSTERS



THE SCIENCE

- **LARGE-SCALE STRUCTURE & COSMOLOGICAL PARAMETERS**
 - **OFER LAHAV, PIRIN ERDOGDU, ANAIS RASSAT**
(SEE TALKS THIS AFTERNOON)
- **AND MUCH MORE!**



YOU'VE JUST MEASURED THE REDSHIFT OF THE LAST GALAXY IN THE UNIVERSE, NOW COMES

FOSTER'S time



M. Foster